



## Unit 1

# Disaster Readiness: Mitigate Now/Save Later

*Objectives: At the end of this unit, participants will be able to:*

- 1. Define mitigation.*
- 2. Cite examples of the high cost of disasters.*
- 3. Specify and describe the variety and frequency of hazards that exist in their area.*
- 4. Describe characteristics of a disaster resistant community.*

## INTRODUCTION

You've purchased a home. You move in and all is right with the world when you realize that your home and family are susceptible to disasters, those acts of nature that could destroy all that you worked so hard for. You ask yourself these questions: Could flooding destroy our home and its contents? If a hurricane or tornado strikes, are we protected? And what about fires? What can I do now that will possibly save lives and thousands of dollars later, after a disaster hits? The answers to these questions and more will be addressed in this course on mitigation techniques for homeowners.

This unit explains what mitigation is and why it should be a part of the plan to save lives and reduce costs associated with disaster. It describes disaster resistant communities and shows examples of home projects that will benefit you, the homeowner, in mitigating hazards associated with your community.

### **WHAT IS MITIGATION?**

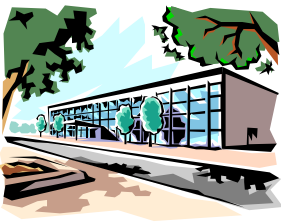
Mitigation is the cornerstone of emergency management. It is the ongoing effort to lessen the impact disasters have on people and property. Mitigation involves keeping homes away from floodplains, engineering bridges to withstand earthquakes, creating and enforcing effective building codes to protect property from hurricanes -- and more.

Mitigation is defined as "**sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects.**" It describes the ongoing effort at the Federal, State, local, and individual levels to lessen the impact of disasters upon our families, homes, communities and economy.

By applying mitigation practices, our society can ensure that fewer Americans and their communities become victims of natural disasters. For example, mitigation measures

- can be applied to strengthen your home, so that your family and belongings are better protected from floods, earthquakes, hurricanes, and other natural hazards.
- can be utilized to help business and industry avoid damages to their facilities and remain operational in the face of catastrophe.
- can be used to strengthen hospitals, fire stations, and other critical service facilities so that they can remain operational or reopen more quickly after an event.
- can help reduce disaster losses and suffering so that there is less demand for money and resources in the aftermath.

In practice, mitigation can take many forms. It can involve actions such as:



- ! Promoting sound land use planning based on known hazards
- ! Buying flood insurance to protect your belongings
- Relocating or elevating structures out of the floodplains
- Securing shelves and water heaters to nearby walls
- Having hurricane straps installed to more securely attach a structure's roof to its walls and foundation
- Developing, adopting, and enforcing effective building codes and standards

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- Engineering roads and bridges to withstand earthquakes
- Using fire-retardant materials in new construction
- Developing and implementing a plan in your business or community to reduce your susceptibility to hazards

In simpler terms, mitigation is important and necessary:

- ✓ To protect people and structures
- ✓ To reduce the costs of disaster response
- ✓ To help reduce the Federal debt

Additionally, mitigation means less:

- ✓ loss of life
- ✓ property damage
- ✓ insurance premiums
- ✓ disruption to the community

### ***REDUCING LOSS OF LIFE AND INJURIES***

A total of over 1,100 deaths resulted from natural hazards events between 1989 and 1994. The potential for much larger numbers of deaths has been reduced in some instances through the determined efforts of society and in other instances by sheer good fortune.

### ***REDUCING ECONOMIC COSTS***

Economic costs take many forms, including costs to repair public infrastructure and privately owned buildings, loss of revenue or earnings and agricultural and industrial productivity, disruption of local communities, and tax dollars spent on disaster response and recovery.

Between 1989 and 1994, the United States suffered an unprecedented number of large-scale natural disasters, including flooding, a massive winter storm on the east coast, earthquakes, hurricanes, wildfires, and volcanic eruptions. During this period the President declared a total of 291 disasters. Federal assistance available to stricken individuals and communities cost the U.S. Treasury over \$34 billion. Seven of these disasters, among the 10 most costly in American history, caused over 370 deaths and losses of over \$85 billion.

A few examples of some very expensive weather-related disasters in the U.S. with extremely high numbers of lives lost are listed below:

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- **Hurricane Andrew**, August 1992. Category 4 hurricane hits Florida and Louisiana; approximately \$27.0 billion damage/costs; 58 deaths.
- **Midwest Flooding**, Summer 1993. Central U.S.; approximately \$21.0 billion damage/costs; 48 deaths.
- **Hurricane Fran**, September 1996. Category 3 hurricane strikes North Carolina and Virginia; over \$5.0 billion damage/costs; 37 deaths.
- **Northern Plains Flooding**, April-May 1997. Severe flooding in the Dakotas and Minnesota due to heavy spring snowmelt; approximately \$2.0 billion damage/costs; 11 deaths.
- **Southeast Severe Weather**, Winter-Spring 1998. Tornadoes and flooding related to El Niño in southeastern states; approximately \$1.0 billion damage/costs; at least 132 deaths.

In nearly every location across the country, homeowners are at risk from a variety of hazards, including floods; earthquakes; high winds from tornadoes, hurricanes, and severe winter storms; and wildfires. Because most of these hazards only occur periodically, however, many homeowners don't even realize the danger they face.

Nearly every location in every State is at risk. Flooding is by far the most prevalent, occurring to some degree in every State in the nation. Forty-one States have a moderate or higher earthquake hazard. Wildfires can occur anywhere that fuel exists and weather conditions are right. In addition, damaging high winds have caused destruction across the nation, particularly in coastal areas. Given the hazards that are out there, homeowners need to take action to protect themselves and their property.

**Fortunately, homeowners can reduce their risk through cost-effective mitigation measures.** Ideally, these measures should be considered before your home is built. For example, potential homeowners should consider carefully the risks they would face by moving to certain high-hazard areas before making the decision to buy or build. Also, when building your home, close attention should be paid to how your home is being constructed. Risks posed by all types of natural hazards (including floods, earthquakes, hurricanes, or wildfire) may be reduced substantially by paying attention to building codes and by incorporating mitigation measures into the structure.

If you have an existing home, however, all hope is not lost. There are also many steps that you can take to better protect yourself from future losses. Buildings subject to earthquakes or high winds may be strengthened to make them more resistant to a variety of hazards. In addition, simple steps can be taken within your home to make your property less susceptible to damages if a disaster occurs.

This course will introduce ways to protect yourself and your home from losses due to winds, floods, earthquakes and fires.

### ***HAZARD IDENTIFICATION AND VULNERABILITY ANALYSIS***

Before implementing mitigation measures, homeowners must be aware of those hazards which, if they occur, could harm your community. This is the purpose of hazard identification and vulnerability.

Everyone knows that natural disasters pose some threat to people, homes, businesses, and communities. We know that severe winds can damage the roofs on our houses and that heavy rains can flood our basements. We usually are aware of the natural disaster history in our communities. We know whether there have been floods, earthquakes, tornadoes, hurricanes, or wildfires. This is where **past history** comes into play. If you have had floods, tornadoes or forest fires before, these disasters could happen again. The risk may be higher than in communities which have not had these disasters. You may know about the history of disasters in your community from personal experience. If not, you may learn about them from oral histories, libraries, local newspaper records, or emergency management office records.

**Weather patterns** are another factor to consider when you determine the dangers to your community from natural disasters. If the weather that affects your community brings regular events like snow, rain or heat, the chances of weather-related emergencies may be high.

**Geographical characteristics** should be considered because if you live near an ocean, a river, a fault line, or mountains, related natural hazards could affect you. Learn the geography in your area and the associated hazards.

Floods, hurricanes, earthquakes, tornadoes, and wildfires are the most frequently occurring natural hazards. Some of these events can cause related or secondary hazard problems. For example, floods can cause mudslides, earthquakes can cause landslides, and wildfires (because they destroy plants) can make hillsides prone to landslide or mudslide.

Defining the extent to which natural hazards threaten your community is **hazard identification**. Hazard identification determines which areas of your community are affected by disasters, how likely it is that the disaster may occur, and how intense the disaster might be.

Areas of concern include:

- How often the hazard is likely to occur
- How severe
- Where it is likely to occur



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- How large an area it will affect
- Who will be affected
- How long it will last
- How fast it is likely to occur
- The time of year it is likely to occur
- How much warning time there is

Next, identifying how people, properties and structures will be damaged by the disastrous event is a **vulnerability analysis**. If people or their homes and other structures can be damaged by a hazard's impact, they are vulnerable.

Natural hazards invariably "seek out" the weakest part of buildings or systems. Strong winds will find the portion of the roof not properly nailed down. Ground motions will find the weak building connectors--structural damage, or worse, building failure, will result. The water treatment plant in the floodplain will stop functioning, and businesses throughout the community will be forced to close until water is restored. Finding the weak points in systems--identifying building types that are vulnerable to damage and anticipating the loss in high risk areas--helps you make decisions later about the expenses associated with reducing the potential for disaster.

Your local emergency manager regularly conducts vulnerability analyses for your community. You can contact your local emergency management office for the results of these analyses.

In summary, hazard identification deals with causes of potential emergencies or disasters. Vulnerability analysis deals with what is most likely to happen to people and property in those disasters. Both these elements are important in determining which mitigation measures are needed for your home.

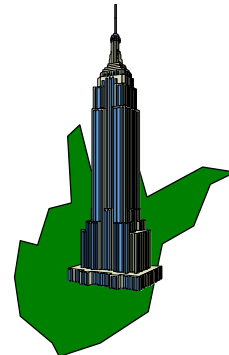
### ***DISASTER RESISTANT COMMUNITIES***

The Federal Emergency Management Agency (FEMA) has launched a national effort to change the way America deals with disasters by shifting the focus of emergency management from responding to disasters to taking actions in advance of disasters that reduce potential damage. Breaking the disaster-rebuild-disaster cycle in the United States is FEMA's top priority. To that end, *Project Impact* was developed to challenge the country to undertake actions that protect families, businesses and communities by reducing the effects of natural hazards. It included the selection of seven pilot communities that demonstrate the benefits of hazard mitigation through a partnership approach and an outreach effort to businesses and communities to become disaster resistant. FEMA's goal is to eventually have at least one disaster-resistant community in each state.

Experience has shown again and again that lives can be saved, damage to property can be reduced significantly, and economic recovery can be accelerated by consistently building safer and stronger buildings, strengthening existing infrastructures, enforcing building codes, and making the proper preparations BEFORE a disaster occurs.

As part of the federal government's commitment to the President's Volunteer Summit, FEMA developed Spring Break '98, a *Project Impact* initiative, providing the nation's youth an opportunity to give back to their community. The Spring Break project, a collaboration between FEMA and the Corporation for National Service, was started when students and volunteers donated their spring break time to help make communities more disaster resistant. Following are a few of the communities that took part in Spring Break '98.

- *Students in the **San Francisco Bay, California**, area spent their Spring Break helping to make homes more resistant to damage from earthquakes and other disasters. They made non-structural retrofits to Oakland homes occupied by low-income seniors and people with disabilities. The students, along with community volunteers and AmeriCorp members, visited 150 housing units and implemented mitigation measures including installing more than 1300 cabinet safety latches, 250 locks for heavy electronic equipment such as televisions and stereos, and securing over 100 refrigerators to make sure that in an earthquake, they would not fall and block exits or cause injuries.*
- *In **Wilmington, North Carolina**, 250 student volunteers from the University of North Carolina at Wilmington spent the day checking and repairing safety devices and installing smoke detectors in the homes of elderly citizens.*
- *In **Tucker and Randolph (West Virginia)** counties, AmeriCorp volunteers worked with students from West Virginia University and Davis-Elkins College to map the longitude and latitude of structures at risk of flooding.*
- *In **Deerfield Beach, Florida**, volunteers from AmeriCorp, Deerfield Beach High School, local Home Depot stores and Southeast Metal Inc., a local business, installed storm shutters on the houses of five single family, low to moderate income homeowners. Southeast Metal donated the accordion shutters (a \$12,000 value).*



With the help of these volunteers, and efforts in other Project Impact communities, these areas have become models for other cities to see how everyone can get involved to make the nation more disaster resistant.

The seven pilot communities identified for Project Impact are Allegany County, MD; Deerfield Beach, Florida; Oakland, California; Pascagoula, Mississippi; Seattle, Washington; Tucker and Randolph Counties, West Virginia; and Wilmington, North Carolina.



Unit Review

Circle the correct response. Answers may be found on page A1.

1. An example of economic costs stemming from a major disaster can be in the form of:
  - a) Funeral costs for disaster-related deaths.
  - b) Relocating a structure out of the floodplain.
  - c) Strengthening partnerships among government and private sector.
2. Mitigation is defined as:
  - a) rebuilding after a disaster strikes.
  - b) search and rescue, mass care, medical services, and bringing damaged services and systems back on line after a disaster.
  - c) ensuring that people are ready for a disaster and will respond to it effectively.
  - d) sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects.
3. Determining which areas of your community are affected by disaster, how likely it is that the disaster may occur and how intense the disaster might be is:
  - a) Hazard Identification
  - b) Mitigation
  - c) Vulnerability Analysis
4. Which of the following natural hazards is most prevalent in the U.S.?
  - a) High winds (hurricanes and tornadoes)
  - b) Flooding
  - c) Technological hazards such as explosions
  - d) Droughts
5. Under Project Impact, a disaster resistant community:
  - a) takes actions that prepare and protect its residents from natural disasters BEFORE they happen.
  - b) is the partnership approach between businesses and the community to break the disaster-rebuild-disaster cycle.
  - c) was first established in seven locations throughout the U.S. and plans are in place to have at least one in every State.
  - d) All of the above.